

REMARKS

Claims 1, 5 and 8-35 were examined and reported in the Office Action. Claims 1, 5, 8-9, 16-22 and 29-35 are rejected. Claims 1, 5 and 8-35 remain.

Applicant requests reconsideration of the application in view of the following remarks.

I. 35 U.S.C. § 103

A. It is asserted in the Office Action that claims 1, 5, 16, 17, 20, 21, 29, 30 33, 34 and 37 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 5,869,208 issued to Miyasaka ("Miyasaka "), in view of U.S. Patent No. 5,641,591 issued to Kawakami et al. ("Kawakami "). Applicant notes that claim 37 was previously canceled. Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2142

“[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.” (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

Further, according to MPEP §2143.03, “[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” “*All words in a claim must be considered* in judging the patentability of that claim against the prior art.” (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant’s amended claim 1 contains the limitations of

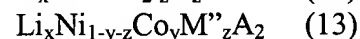
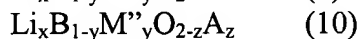
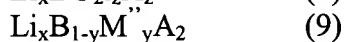
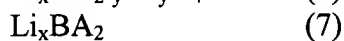
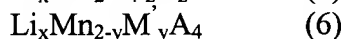
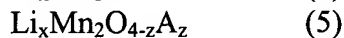
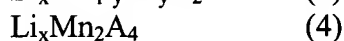
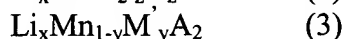
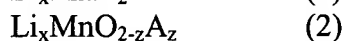
[a] rechargeable lithium battery comprising: a positive electrode including a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a negative electrode including a carbonaceous material as an active material; and an electrolyte including an organic solvent and a lithium salt dissolved in the organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, a binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:

- | | |
|---|------|
| Li_xMnA_2 | (1) |
| $\text{Li}_x\text{MnO}_{2-z}\text{A}_z$ | (2) |
| $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$ | (3) |
| $\text{Li}_x\text{Mn}_2\text{A}_4$ | (4) |
| $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$ | (5) |
| $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$ | (6) |
| Li_xBA_2 | (7) |
| $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ | (8) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2$ | (9) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z$ | (10) |
| $\text{Li}_x\text{NiCoA}_2$ | (11) |
| $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_2$ | (12) |
| $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2$ | (13) |

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Applicant's amended claim 5 contains the limitations of

[a] method of making a rechargeable lithium battery comprising: forming a positive electrode by physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; forming a negative electrode including a carbonaceous material as an active material; preparing an electrolyte including an organic solvent including a lithium salt dissolved in the organic solvent; coating the positive active material composition on a current collector; and drying the current collector coated with a positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:



where $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Miyasaka discloses a lithium ion secondary battery. Miyasaka further discloses aluminum as one of the electroconductive materials. Aluminum, however, is not preferred as an electroconductive material. Moreover, use of a mixture of aluminum and carbon conductive material is not disclosed, taught or suggested by Miyasaka (see Miyasaka, column 8, lines 7-15).

Additionally, it is asserted in the Office Action that 2 to 15 wt% of the electroconductive material disclosed in Miyasaka is the amount of the metal additive. Such an amount, however, is just the electroconductive material, and is not the amount of the metal additive. That is, Miyasaka is silent on the metal conductive material being used in mixture of a metal and a carbon conductive material. Therefore, the effect caused by the amount used of 0.01 to 10 wt% cannot be obtained or expected from Miyasaka.

Kawakami discloses a rechargeable battery using a lithium chemical reaction. In Applicant's claimed invention, a carbonaceous material is used as a negative active material. Distinguishable, in Miyasaka and Kawakami, a lithium alloy and lithium or zinc are used as a negative active material, respectively. Therefore, a person having ordinary skill in the art would not be expected to apply the electrically conductive material of Kawakami to technique of Miyasaka.

Further, neither Miyasaka nor Kawakami teach, disclose or suggest

[a] rechargeable lithium battery comprising: a positive electrode including a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a negative electrode including a carbonaceous material as an active material; and an electrolyte including an organic solvent and a lithium salt dissolved in the organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, a binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13 ...

or

[a] method of making a rechargeable lithium battery comprising: forming a positive electrode by physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; forming a negative electrode including a carbonaceous material as an active material; preparing an

electrolyte including an organic solvent including a lithium salt dissolved in the organic solvent; coating the positive active material composition on a current collector; and drying the current collector coated with a positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:..

Neither Miyasaka, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest all the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Miyasaka, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, Applicant's amended claims 1 and 5 are not obvious over Miyasaka in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 16, 17, 20 and 21, and 29, 30 and 33-34, respectively, would also not be obvious over Miyasaka in view of Kawakami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 5, 16, 17, 20, 21, 29, 30 33 and 34 are respectfully requested.

B. It is asserted in the Office Action that claims 1, 5, 16, 17, 20, 21, 29, 30, 33 and 34 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 5,851,696 issued to Saidi et al. ("Saidi"), in view of U. S. Patent No. 5,641,591 issued to Kawakami et al. ("Kawakami"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's claims 16, 17, 20 and 21 either directly or indirectly depend on amended claim 1. Applicant's claims 29, 30 and 33-34 either directly or indirectly depend on amended claim 5. Applicant has addressed Kawakami above in section I(A) regarding amended claims 1 and 5.

Saidi discloses an electrochemical cell having a nonmetal negative electrode without using any solid metal active material. Saidi, however, does not teach, suggest or disclose

[a] rechargeable lithium battery comprising: a positive electrode including a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a negative electrode including a carbonaceous material as an active material; and an electrolyte including an organic solvent and a lithium salt dissolved in the organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, a binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13 ...

or

[a] method of making a rechargeable lithium battery comprising: forming a positive electrode by physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; forming a negative electrode including a carbonaceous material as an active material; preparing an electrolyte including an organic solvent including a lithium salt dissolved in the organic solvent; coating the positive active material composition on a current collector; and drying the current collector coated with a positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:..

Neither Saidi, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Saidi, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Saidi in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 16, 17, 20 and 21, and 29, 30 and 33-34, respectively, would also not be obvious over Miyasaka in view of Kawakami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 5, 16, 17, 20, 21, 29, 30, 33 and 34 are respectfully requested.

C. It is asserted in the Office Action that claims 22 and 35 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Saidi, in view of Kawakami and further in view of U. S. Publication No. 2001/0010807 by Matsubara ("Matsubara"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's claim 22 is directly dependent on amended claim 1. Applicant's claim 35 is directly dependent on amended claim 5. Applicant's claim 22 directly depends on claim 1. Applicant claim 35 directly depends on claim 35. Applicant has addressed Saidi and Kawakami regarding claims 1 and 5 above in section I(B).

Matsubara discloses a lithium/nickel/cobalt composite positive active material for a secondary battery. Matsubara, however, does not teach, suggest or disclose

[a] rechargeable lithium battery comprising: a positive electrode including a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a negative electrode including a carbonaceous material as an active material; and an electrolyte including an organic solvent and a lithium salt dissolved in the organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, a binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13 ...

or

[a] method of making a rechargeable lithium battery comprising: forming a positive electrode by physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; forming a negative electrode including a carbonaceous material as an active material; preparing an electrolyte including an organic solvent including a lithium salt dissolved in the organic solvent;

coating the positive active material composition on a current collector; and drying the current collector coated with a positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:..

Neither Saidi, Kawakami, Matsubara, and therefore, nor the combination of the three, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Saidi, Kawakami, Matsubara, and therefore, nor the combination of the three, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Saidi in view of Kawakami and Matsubara since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly depend from amended claims 1 and 5, namely claims 22, and 35, respectively, would also not be obvious over Miyasaka in view of Kawakami and Matsubara for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 22 and 35 are respectfully requested.

D. It is asserted in the Office Action that claims 1, 5, 8-9, 16-19 and 29-32 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 6,589,694 issued to Gosho et al. ("Gosho") and further in view of Kawakami. Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant has addressed Kawakami above in section I(A) regarding claims 1 and 5.

Gosho discloses a positive electrode active material, a negative electrode active material and an electrolyte used in a non-aqueous secondary battery. Gosho, however, does not teach, suggest or disclose

[a] rechargeable lithium battery comprising: a positive electrode including a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a negative electrode including a carbonaceous material as an active material; and an

electrolyte including an organic solvent and a lithium salt dissolved in the organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, a binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13 ...

or

[a] method of making a rechargeable lithium battery comprising: forming a positive electrode by physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; forming a negative electrode including a carbonaceous material as an active material; preparing an electrolyte including an organic solvent including a lithium salt dissolved in the organic solvent; coating the positive active material composition on a current collector; and drying the current collector coated with a positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:..

Neither Gosho, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above.

Since neither Gosho, Kawakami, and therefore, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Gosho in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 8, 16 and 19, and 9 and 29-32, respectively, would also not be obvious over Gosho in view of Kawakami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 5, 8-9, 16-19 and 29-32 are respectfully requested.

CONCLUSION

In view of the foregoing, it is submitted that claims 1, 5 and 8-35 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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Dated: February 16, 2006

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on February 16, 2006.


Jean Svoboda